Global Logistics Performance Analysis Report

Project #3 – International Supply Chain & LPI Score Assessment

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Role Targeted:
Business Analyst | Operations Analyst | Systems Analyst

Tools Used:
Excel • SQL • Power BI

Date Completed:
November 2024

Portfolio Repository:

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Project #3: Global Logistics Performance Analysis Report

Project Overview

This project evaluates international logistics performance using the **Logistics Performance Index (LPI)**. The goal is to identify country-level strengths and weaknesses in **supply chain efficiency**, highlight **infrastructure quality gaps**, and provide strategic recommendations to improve global logistics operations.

Objectives

- Identify **top & bottom 3 countries** by LPI Score (2023)
- Analyze **global LPI score trends** (2010–2023)
- Visualize **LPI performance distribution** across countries
- Compare **global infrastructure quality** by country
- Support policy and business decisions through **data-driven logistics insights**

Tools Used

- **Excel -** Data Cleaning & Preparation
- **SQL (Microsoft SQL Server) -** Data Extraction & Analysis
- **Power BI –** Data Visualization, Calculated Fields & Interactive dashboard

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Dataset Source

This project uses the dataset **"Logistics Performance Index (LPI)"** from the **World Bank's Logistics Performance Index (LPI)**, which measures the logistics efficiency of **100+ countries** based on factors like **customs**, **infrastructure**, **international shipments**, and **delivery timelines**.

Data Cleaning & Preparation

Performed in **Excel** and **SQL**, the dataset was cleaned and structured for analysis through:

- **Removed grouped ranks, duplicate scores, and metadata columns** from the raw LPI dataset
- **Merged LPI data across years (2010–2023)** into a standardized long-format structure
- **Handled missing values** and cleaned data inconsistencies
- **Enforced consistent column names** and ensured consistent **data types**
- **Manually mapped regions to countries** for global segmentation
- Created a **Data Dictionary** tab to document all fields and descriptions
- **Exported cleaned dataset** as `.xlsx`, `.csv` for use in **SQL** analysis and **Power BI** visualizations

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Key Insights & Findings

1. Top & Bottom 3 Countries by LPI Scores (2023)

- **Top Performers:** *Singapore (4.30), Finland (4.20), Denmark, Germany, Netherlands, Switzerland (4.10).*
- **Lowest Countries**: *Libya & Afghanistan (1.90), Somalia (2.00).*

Summary of Impact: Countries with **conflict** or **underdeveloped infrastructure** rank lowest, while **Northern Europe** and **East Asia** lead in global logistics.

2. Global Average LPI Trend (2010–2023)

- Global average improved from **2.87 (2010)** to **3.00 (2023).**
- Sharp increase in **2023**, showing renewed global investment.

Summary of Impact: Reflects steady **supply chain progress** and increasing investment in **logistics modernization.**

3. Global LPI Score Distribution by Country (2023)

- Countries across **Europe** and **East Asia** dominate high LPI scores**.**
- Lower scores are concentrated in **Sub-Saharan Africa** and **fragile economies.**

Summary of Impact: Signals urgent need for **logistics support** and **infrastructure funding** in low-performing regions.

4. Infrastructure Quality Leaders & Laggards (2023)

- **Top Performers**: *Singapore (4.6), Switzerland (4.4), Canada (4.3), Germany (4.3).*
- **Lowest Performers:** *Libya (1.7), Afghanistan (1.7), Madagascar/Haiti (1.8).*

Summary of Impact: **Infrastructure quality** strongly correlates with **LPI success**. Improving logistics infrastructure in low-performing regions is critical for **economic development**.

Power BI Dashboard Preview

The Power BI dashboard delivers **interactive insights** on:

- **Global logistics performance** by country
- **Top** and **bottom LPI scores** (2023)
- **Infrastructure performance segmentation**
- **Global LPI score averages** across time (2010–2023)
- **Region-level comparisons** and **global heat map**
    - **Dashboard Name**: *Global Logistics Performance Dashboard (Power BI Visualization).*
    - **Upload Details:** *Published to Power BI and saved as `.pbix` file*
    - **Dashboard Preview:** *See Figure 1 below*

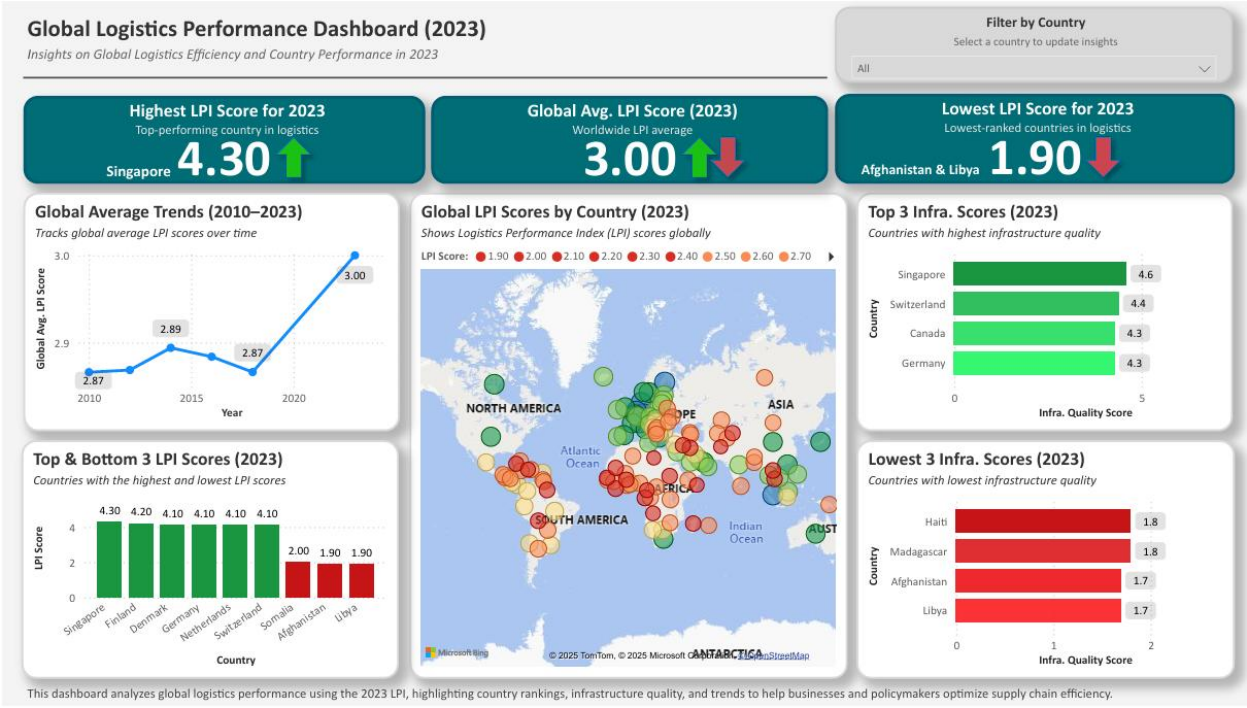

Figure 1: Global Logistics Performance Dashboard (2023) – Power BI Visualization.

Business Impact & Recommendations

This analysis helps **policymakers** and **business leaders** strengthen logistics systems by:

1. Investing in Infrastructure

- Prioritize improvements in **low-performing countries** to support **trade growth**.

2. Benchmarking High Performers

- Apply successful strategies from top countries like ***Singapore*** and ***Germany*** to improve logistics policy and technology.

3. Tracking Progress Over Time

- Use **LPI data** as an ongoing benchmark to guide reforms and monitor logistics development

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SQL Queries & Data Extraction

To analyze logistics performance trends, key insights were extracted using **SQL** in **Microsoft SQL Server**. Below are the primary queries:

1. Retrieve Available Years in the Dataset

```
SELECT DISTINCT Current_Year
FROM LPI_International_Logistics_Analysis;
```

Purpose: Lists all unique years in the dataset to support trend analysis.

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2. Top 3 LPI Scores (2023)

```
SELECT TOP 3 Economy, LPI_Score
FROM LPI_International_Logistics_Analysis
WHERE Current_Year = 2023
ORDER BY LPI_Score DESC;
```

Purpose: Identifies the 3 countries with the highest LPI scores in 2023.

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3. Bottom 3 LPI Scores (2023)

```
SELECT TOP 3 Economy, LPI_Score
FROM LPI_International_Logistics_Analysis
WHERE Current_Year = 2023
ORDER BY LPI_Score ASC;
```

Purpose: Returns the 3 lowest-ranked countries by logistics performance in 2023.

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4. Global Average LPI Scores Over Time

```
SELECT Current_Year, AVG(LPI_Scores) AS Avg_LPI_Score
FROM LPI_International_Logistics_Analysis
GROUP BY Current_Year
ORDER BY Current_Year ASC;
```

Purpose: Calculates average LPI score per year to visualize global trends.

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5. Infrastructure Scores by Country (2023)

```
SELECT Economy, Infrastructure_Score
FROM LPI_International_Logistics_Analysis
WHERE Current_Year = 2023
ORDER BY Infrastructure_Score DESC;
```

Purpose: Ranks 2023 infrastructure scores to compare top and bottom countries.

SQL Summary

SQL was used to **extract**, **filter**, and **analyze logistics performance data** directly from the **cleaned dataset**. Key queries retrieved **top and bottom LPI scores**, **tracked global trends** from **2010 to 2023**, and **calculated global averages** for deeper insight into **performance changes over time**. This **structured querying approach** ensured **data accuracy**, **transparency**, and **reproducibility** throughout the analysis process.

Key SQL Queries Used:

- **Retrieve Unique Years** for Time-Series Analysis
- **Top 3** & **Bottom 3 Countrie**s by LPI Score (2023)
- **Global Average LPI Score by Year** (2010–2023)
- **Global LPI Score Distribution by Country** (2023)
- **Top** & **Bottom Countries by Infrastructure Score** (2023)

File Export & Submission

- **Cleaned dataset** exported as `.xlsx` and `.csv` for use in **SQL** and **Power BI**
- **Power BI Dashboard** `.pbix` saved for **portfolio use**
- **SQL Query File** `.sql` saved for **portfolio use**
- **Dashboard image** exported as `.png` and `.pdf` for **professional sharing**
- Finalized documentation (**this report**) saved as `.docx` and `.pdf`
- **GitHub README** included as both `README.md` and `.pdf`
- All **project files** are organized and stored in **GitHub** and **LinkedIn portfolio** for **easy access**

Final Thoughts

This project delivers a **data-driven assessment** of **global logistics performance** using **Excel, SQL, and Power BI**. It identifies **performance gaps** across countries, highlights **infrastructure disparities**, and provides **actionable recommendations** to support **trade readiness** and **supply chain strategy**—key focus areas for roles such as **Business Analyst**, **Operations Analyst**, and **Systems Analyst**.

The **interactive dashboard** and all supporting files are included in my professional portfolio on GitHub, including the Power BI file: **`Logistics_Performance_Dashboard.pbix`** and the SQL queries used in this analysis: **`logistics_analysis_queries.sql.`**